Federation of Earth Science Information Partners

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Partnership Application

Please complete all sections to the fullest extent possible and forward completed application to: Carol Meyer, carol.meyer@earthsciencefoundation.org. If you have any questions, please contact her at 877.870.3747.

I. CONTACT INFORMATION

A. Primary Contact/Principal Investigator

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B. Designated Assembly Representative (could be same as above)

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C. Other Contacts

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Email:

Name:

Address:

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Name:

Address:

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II. ABOUT YOUR ORGANIZATION

A. ORGANIZATION/DIVISION/PROJECT NAME:

Thetus Corporation

B. OVERVIEW OF YOUR PRIMARY ACTIVITIES (250 words or less)

Thetus Corporation designs, develops, and delivers enterprise-class semantic knowledge modeling and discovery software. Thetus enables organizations to derive maximum value from complex, highly-evolving data sources ranging from raw signal data collected from satellites, sensors and other devices to structured, semi-structured and unstructured data. Thetus works with organizations in both the public and private sector. Founded in 2002 and headquartered in Portland, Oregon, Thetus is a privately-held corporation funded through a combination of private and institutional equity. Thetus' primary activity involves working with complementary software vendors and systems integrators to deliver solutions that allow organizations to improve information access, collaboration, analysis and decision support. Thetus software was conceived and continues to be developed based on the underlying principle that data demands careful attention. In order to meet the challenges posed by exponential growth in geospatial and non-geospatial data collection, systems must be put in place that can automate processing and provide distributed communities the ability to access information tuned to their specific operational environment and objectives. Traditional database-driven architectures are not well-suited to keep pace with complex, ever-changing systems. Without such a system, large amounts of high-value information often go undiscovered and opportunities for enhancing knowledge are lost. Thetus software bridges this "knowledge gap".

In addition to business activity, Thetus supports a variety of academic research projects surrounding the collection, processing and analysis of earth sciences data. Universities and research organizations have deployed Thetus software to manage large volumes of complex, multi-layered data in support of modeling, tracking and evolving knowledge.

C. Please list and briefly describe the primary product(s) or service(s) that your organization provides (will provide) to the community.

Thetus Publisher™
The Thetus Publisher™ is enterprise-class client/server infrastructure software that provides a framework for semantically-based knowledge modeling and discovery. Thetus Publisher is comprised of six primary components, all of which work in tandem to transform data into dynamic knowledge models that allow organizations to build flexible and reusable knowledge assets which can be shared across communities. Thetus Publisher provides a framework for abstracting knowledge from evolving, distributed source data and enabling users to access highly-focused and context-filterable views of information and knowledge relevant to their specific problem.

Knowledge Abstraction and Codification: Thetus Publisher automates the extraction of metadata from source data and incorporates the metadata into a semantic knowledge model, or ontology. The knowledge model is a highly-descriptive, machine-readable structure of concepts and relationships. Data formats and descriptions vary widely from source to source and different systems use different terms to describe data. Abstracted knowledge models enable multiple participating communities to search, access and analyze information using the familiar terms and context of their specific domain.

Semantic Search: Thetus Publisher features a powerful semantic search engine. Concept-based semantic search enables users to perform more intuitive searches using the terms of their domain as opposed to the restrictive terms of the database. Users can directly annotate and relate search results and tie new discoveries back to the knowledge model where the information is made instantly available for further analysis, annotation, and collaboration. Thetus' inference-enabled search allows users to discover hidden trends, patterns, and relationships among information. Critical connections that otherwise would have gone undiscovered are exposed to users through a variety of visualization interfaces—enabling thorough exploration of interconnections among information.

Workflow: Non-text data requires significant pre-processing to derive useful information for discovery and decision making. Thetus Publisher provides automated and on-demand workflow for dispatching data to external computing resources responsible for data processing tasks, such as routing, filtering and notification alerts. Thetus Publisher provides a unified analytics pipeline for automatically pre-conditioning data to deliver highly-focused information—enabling users to spend the majority of their time analyzing and making decisions as opposed to assembling data for analysis. The workflow engine allows for easy integration of a wide variety of analytics including entity extraction, link analysis, and geotagging.

Lineage: Thetus Publisher features advanced lineage tracking and reporting tools for monitoring and recording all activity related to data, metadata, and usage (interactive and agent-based). Lineage is the Who, What, Where, When, and Why about evolving information. Lineage provides a mechanism for chronologically navigating the history of any given resource throughout its entire lifecycle. Lineage enables a variety of essential features for better understanding, evaluating, and defending the ways in which information is utilized in the decision-making process. Lineage also provides a comprehensive view of exactly how and why knowledge models evolve over time.

Policy: The diversity of data sources involved in cross-community collaboration necessitates more than just standard role or group-level security. Complex information access guidelines require implementation of system-wide policy control. Thetus Publisher enables organizations to deploy policy parameters for control over data access, processing, and publishing. Thetus' rules-based policy enforcement provides the flexibility to ensure effective information sharing while protecting sensitive data.

Clients and Tools: Thetus provides a wide variety of clients and tools. System clients are provided for managing ontologies, search, workflow, policy and users. Thetus also provides a variety of tools for end-user interaction. The Thetus Knowledge Portal provides an intuitive browser-based interface that allows users to access and interact with personalized, filterable views of information collected and assembled from disparate sources. The portal includes a rich set of dynamically-configurable tools that enable users to search, analyze, collaborate and visualize information geospatially, contextually and temporally. The portal framework adheres to industry standards, enabling rapid deployment on a broad range of enterprise servers. Thetus also features plug-ins for integrating knowledge modeling and discovery toolbars into existing applications, including leading GIS applications.

D. Please give a main website address for the proposed Partnership:

Web Address: http://www.thetus.com

III. HOW YOUR ORGANIZATION WILL BENEFIT FROM/CONTRIBUTE TO THE EARTH SCIENCE INFORMATION PARTNERS (ESIP) FEDERATION

A. Describe current or anticipated users of your products and services and how you think the Federation can help you better serve this population. (200 words or less)

Thetus' user base in the earth sciences arena includes several government customers who collect geospatial data in support of intelligence gathering and defense. Additionally, the USDA Forest Service has deployed Thetus software to automate the processing of MODIS data collected from the NASA Earth Observation System to model the behavior and impact of fires on ecosystems. Thetus Publisher's automated workflow engine automates the extraction of metadata from raw satellite data and utilizes the knowledge model to manage processing and the publication of data products. Lineage tracks all processing to enable efficient reprocessing.

As Thetus grows its customer base, there will be a great need for organizations and enterprises in both the public and private sector to leverage geospatial data. From environmental research to enterprise location intelligence, the exploitation of geospatial data will become increasingly critical. Thetus believes the ESIP Federation will be a valuable resource for knowledge regarding the overall geospatial landscape and how Thetus can continue to develop innovative new methods for utilizing geospatial data as part of a flexible, reusable knowledge asset.

B. Describe any Earth science technologies that you have developed and are willing to bring to the Federation's efforts to provide best-practices. (200 words or less)

Thetus software was developed to address the need to model complex, ever-changing environments where there is a need to keep pace with large volumes of new and existing data. (See Section C above for product/technology details.) Thetus is interested in exploring the potential of how semantic technologies can be utilized to improve the ways in which organizations manage geospatial information. In particular, Thetus' semantic approach to information management is particularly well suited to providing a framework in which to create, test and analyze cause-and-effect scenarios. This capability has huge potential to support the efforts of the Earth Information Exchange and its associated environmental topics. These topics are prime examples of complex systems that involve multi-format, multi-source data and cross-community information sharing and collaboration. Traditional database-driven technologies require an additional layer of knowledge abstraction in order to enable organizations to efficiently perform predictive forecasting.

C. Describe how your proposed membership would contribute to the efforts and the mission of one or more standing committees, working groups and/or clusters. See Page 3 for descriptions of the different activities of the various standing committees, working groups, and clusters. (200 words or less)

Thetus would contribute a wealth of knowledge and experience in the overall area of managing earth sciences information. Thetus' commitment to ensuring the interoperability of knowledge across systems and communities lends itself very well to the efforts and mission of the Information technology and Interoperability Committee. Thetus Publisher leverages universal, machine-readable metadata standards developed by the World Wide Web Consortium (W3C) to ensure ease-of-integration across systems. Thetus software is designed for maximum interoperability with complementary applications, database technologies, and service-oriented architectures. Thetus' years of designing, developing and deploying semantically-based information management systems would also contribute significantly to the activities of the Semantic Web Cluster.

D. Describe your own use of Earth science information and data and how you would see this use enhanced by your partnership in the Federation. (200 words or less)

Thetus has made significant use of satellite data, including MODIS data collected from the NASA Earth Observation System. Thetus has also worked extensively with NOAA Class data as well as the SWEET

ontologies developed by NASA. By joining the Federation, Thetus hopes to collaborate with leading data providers as well as researchers in the public and private sector who are developing standards-based ontologies.

IV. YOUR CHOICE OF MEMBERSHIP TYPE. PLEASE CHECK ONE.

ESIP-I (primarily a data archive center) ☐

ESIP-II (primarily a research center) ☐

ESIP-III (primarily applications and education) ☒

ESIP-IV (primarily a sponsoring member) ☐

V. Any other comments about your proposed membership and its relation to the Federation that you wish to provide.

Danielle Forsyth, Thetus CEO and co-founder, has participated in past ESIP Federation events and plans on presenting at future conferences. In August of 2004, Danielle co-presented with Rob Raskin of NASA's Jet Propulsion Laboratory at the ESIP Federation Technical Workshop. The presentation was titled *Ontologies for Earth Science* and focused on how a semantic approach to managing earth sciences information results in dramatic improvements to the speed, efficiency, and effectiveness with which distributed communities can leverage collective data assets.

Danielle has submitted a speaking abstract for the ESIP Federation Summer Meeting being held in July of 2007 in Madison, Wisconsin. The presentation is titled *Knowledge Modeling and Discovery: Understanding Risks, Outcomes and the Ever Changing Nature of Complex Systems.* The complete abstract is available for review at http://wiki.esipfed.org/index.php/Semantic_Web

Thetus looks forward to further contributing to the ESIP Federation and its activities.

Thank you for your application for partnership in the ESIP Federation.

List of Federation Committees and Clusters

Administrative Committees

Executive Committee: Comprised of all standing and administrative committee chairs, ESIP Type Representatives, the President and Vice President of the Federation. Oversight body for most day-to-day activities of the Federation, acts on behalf of the Assembly between meetings.

Constitution and Bylaws: Provides counsel on matters related to the constitution and bylaws and other related issues (e.g. amendments to government documents)

Finance and Appropriations: Oversees financial resources of the Federation, including the annual budgeting process.

Partnership: Reviews and processes all applications for membership before making applications available for review by members of the Federation. Deals with other membership-related issues.

Standing Committees:

Commercial Development: Promotes a forum wherein commercial development of Earth science information can be fostered.

Community Engagement: Provides a forum for the Federation to promote partner products and to engage new users for data products and services.

Education: Provides a forum to make accessible to educators and learners at all levels in both formal and informal educational contexts the Earth science data, information, tools, and curricula available within the ESIP Federation.

Information Technology and Interoperability: Provides a forum for discussing information technology and interoperability issues of the Earth science community and serves as a central point for activities in this realm.

*Products and Servic*es: Provides a forum for defining best practices and defining requirements for earth science products and services. Currently is involved in developing an inventory of partner products and services.

Clusters (presently active, April 2005):

GIS

Intelligent Systems

Air Quality